

Project Proposal:

USDA State & Private Forestry Grant



Applicants: Florida Division of Forestry

Project: **Woody Biomass Availability and Harvesting in Northwest Florida**

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Project Proposal Abstract: This project proposes to systematically sample understory vegetation deemed harvestable for energy production in a six-county area (all of District 4, Florida Division of Forestry) in the panhandle region of Florida. A separate part of the project will test technical and economical feasibility of understory biomass harvesting and chipping during a tree-length thinning operation on the Tate's Hell State Forest and on a Non-Industrial Private Forest (NIPF) tract. The deliverables from the understory inventory component of the project will be: (1) estimates of harvestable understory biomass in the six-county area by land ownership class (NIPF, other private, state, federal, and total); (2) published understory biomass prediction equations based on stem DBH and total height measurements, by species; (3) published energy values (BTUs per pound) for sampled understory species. The deliverables from the harvesting component of the project will be: (1) a published report describing technical and economical feasibility of fuel chips production on wet and upland pine sites in Florida, including vegetation changes resulting from reintroduction of prescribed fire into these ecosystems; (2) a 10-minute instructional video documenting fuel chip production methods. The project's inventory component encompasses 2.5 million acres in the panhandle region of Florida. The harvesting component although physically limited to two tracts of land, has landscape scale applicability in the whole Lower Coastal Plain of the Southeastern U.S.

Partnering Agencies and Groups: Dr. Marian Marinescu, Assistant Professor of Forest Utilization and Economic Sustainability, University of Florida, West Florida Research and Education Center, Milton, FL

Project Location: District 4 Florida Division of Forestry (Gadsden, Leon, Jefferson, Liberty, Franklin, Wakulla Counties, FL), and Tate's Hell State Forest (Franklin County, FL)

Expected Completion Quarter: Q4 2010

Total Federal Funding Request: \$100,000 (FY '08 - \$49,900, FY '09 - \$43, 800, FY '10 - \$6,300)

Total Proposal Budget Including Match: \$200,000

Cost Category	REQUESTED	MATCH
Personnel		\$30,000
Materials & Supplies	\$1,000	\$10,000
Equipment		\$10,000
Travel	\$3,000	\$ 5,000
Contracts	\$95,000	
Printing		
Administration	\$1,000	\$45,000
TOTALS	\$100,000	\$100,000

Project Description and Benefits: The biomass inventory part of the project will cover Gadsden, Leon, Jefferson, Liberty, Wakulla and Franklin Counties (District 4, Florida Division of Forestry). This area consists of 54% private and 46% publicly managed lands. Most of the public lands are state and federal forests. The overall land base of these counties is 2.50 million acres, of which roughly 1.14 million forested acres could be expected to carry usable understory biomass. First, existing GIS data layers, aerial photographs and other remotely sensed data will be used to construct a forest map depicting potential understory biomass availability. Reserved forests and other areas withdrawn from timber production will not be considered for field understory biomass sampling. Approximately 100 sampling points on a grid (one point per 11,400 acres) will be superimposed on the map depicting biomass availability. Subsequently, each point will be navigated to with GPS, marked in the field and sampled for understory biomass as follows. On each circular 0.005 acre plot all understory woody stems DBH ≥ 1 inch will be cut at the ground level, measured for total height and DBH, and have their species recorded. All woody parts of stems and branches will be cut to approximately one foot sections, kept separate by plant, and transported to the lab for green and dry weight measurements.

Project Evaluation Criteria:

Discussion: (Continued)

Regional Relevance:

The ecosystem restoration efforts on Tate's Hell State Forest in Florida that this project will contribute to are part of a larger strategy of restoring historical hydrological conditions in the lower Apalachicola and Ochlockonee Rivers. This in turn is part of watershed planning efforts contributing to restoration of marine ecosystem health of Apalachicola National Estuarine Research Reserve, which is one of the most productive estuarine systems in the Northern Hemisphere, bordering Tate's Hell State Forest to the south. On yet larger scale, restoration of proper hydrology on Tate's Hell State Forest contributes to better water storage, reduced flood risk, and overall better hydrological conditions in the Apalachicola-Chattahoochee-Flint Rivers watershed, an area reaching as far north as Atlanta, Georgia and also important to eastern half of Alabama and middle section of Florida panhandle, which testifies to the regional importance of this project. In addition, Regional Priority Issues this project is connected to include: **Wildland Fire and Forest Fuels**, **Changing Markets**, **Forest Health**, and **Water Quality and Quantity**, as described above.

Prioritization – The importance of this project stems from state policy goals of developing renewable energy sources to partially replace fossil fuel combustion and achieve reduction in greenhouse gas emissions. Development of energy production from biomass feedstocks is one of the top priorities in Florida's renewable energy program captured in the state's **Farm to Fuel Initiative** (Florida Statutes, Sec. 970-594, 2006). Florida also plays a prominent role in the National **25 x '25 Initiative**, which seeks to produce 25% of all energy consumed in the U.S. from American farms, forests and ranches by year 2025. In July 2007, Florida's Governor Charlie Crist promulgated an **Executive Order 07-127** initiating rulemaking requiring Florida's utilities to produce at least 20% of all electricity from renewable fuels. Currently Florida produces approximately 0.6% of its electricity from wood sources. In our estimates this number could rise to about 2%, if both woody understory and harvesting slash are utilized as energy feedstocks. Conducting proposed woody biomass inventory and investigating applicability of conventional harvesting techniques to understory harvest is necessary to achieve the stated goals. Also, the inventory part of our project could be the first step in a similar state-wide biomass assessment.

Meaningful Scale – The project's inventory component encompasses 2.5 million acres in the panhandle region of Florida. The harvesting component although physically limited to two tracts of land, has landscape scale applicability in the whole Lower Coastal Plain of the Southeastern U.S.

Collaboration – This project will be implemented by a Forest Utilization Specialist in the Florida Division of Forestry and an Assistant Professor of Forest Utilization at the University of Florida. Half of the project harvesting activities will take place on a forest belonging to a Florida NIPF landowner. Florida Natural Areas Inventory (FNAI) will be a subcontractor on vegetation changes assessment part of the project. In developing this proposal and planning for the project the author consulted the following organizations: U.S. Forest Service, Forest Inventory and Analysis (FIA) unit in Tennessee; U.S. National Forests in Florida in Tallahassee; Forest Protection Bureau, four county foresters, and two staff foresters on Tate's Hell State Forest, all from the Florida Division of Forestry; Florida Division of Marketing; Florida Fish and Wildlife Conservation Commission (FFWCC) in Tallahassee; Florida Natural Areas Inventory in Tallahassee; Smurfit-Stone Container Corporation in Panama City; St. Joe Company, Port St. Joe; Telogia Power Plant in Liberty County; Ron Sachs Communications, Inc. in Tallahassee; and last but not least the Lott Logging Company, Valdosta, Georgia of the Westbrook *et al.* (2006) publication.

Outcomes – Approximately \$75,000 of sought funding will be used to conduct understory biomass inventory in the six-county region, collect the data and publish the results as described in Project Description section. About \$14,000 will be used to pay for vegetation surveys conducted by Florida Natural Areas Inventory. The \$6,000 of grant monies will be used to produce the instructional biomass harvesting video. The biomass harvesting part of the project is expected to be self-funded by sale of the roundwood products and fuel chips harvested during the project. Administration of the project will be paid by in-kind contributions of time spent on the project by the lead and collaborating personnel.

Technology – The inventory part of the project will make extensive use of existing GIS data layers, remotely sensed data and GPS technology as described in Project Description section.

Integrated Delivery – Biomass inventory will be coordinated with seven federal and state agencies, as well as with private landowners managing forestlands in the proposed six-county inventory project area. The results of the biomass harvesting study will be widely shared with other state and federal agencies in the continued **education programs and workshop formats**.

Leverage – This project will leverage the sought \$100,000 of federal funding with \$50,000 matching in-kind (time) salary contributions from the Florida Division of Forestry, \$30,000 of matching funds from the University of Florida for a graduate student stipend, and another \$20,000 of matching salary in-kind (time) contribution from the University of Florida faculty collaborator. All of the \$100,000 matching funds and in-kind contributions are from the state of Florida sources.

Project Evaluation Criteria

Discussion (Continued):

Influence Positive Change – Biomass inventory and harvesting experimental results will be published, and skills learned conveyed to others via produced video, workshops and presentations to implement the project results beyond the life of the project itself.

Timeliness – The understory biomass inventory part of the project will be performed in 2008-09 timeframe. Harvesting of understory biomass will be performed in calendar 2008. Vegetation monitoring will take place from 2008 until fourth quarter of 2010. Results of all components of the project with the exception of the vegetative surveys will be published by December 2010. Results of the vegetative surveys will be published in 2011 using separate funds.

References:

Florida Department of Agriculture and Consumer Services, Division of Forestry. 2006. Ten-year Resource Management Plan for the Tate's Hell State Forest.

Franchi, B.L., Savelle, I.W., Watson, W.F. and Stokes, B.J. 1984. Predicting Biomass of Understory Stems in the Mississippi and Alabama Coastal Plains. Technical Bulletin 124. Mississippi Agricultural and Forestry Experiment Station, Mississippi State University.

Westbrook, M.D., Greene, W.D., Ilzar, R.L. 2006. Harvesting Forest Biomass by Adding a Small Chipper to a Ground-Based Tree-Length Southern Pine Operation. Paper presented at the 2006 Annual Meeting of the Council on Forest Engineering, Coeur D'Alene, ID, August 1, 2006.